Space Weather Forecast

Issued on Monday, 26 September 2022 at 01:11 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Minor Geomagnetic Storm day 1 (26th) from possible CME influence. Daily chance of Minor Radio Blackouts (R1) throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity, as measured by GOES-16 and 17 satellites, has been Low, with further Common-class flares, originating from two sunspot regions located in the northeast and southeast quadrants.

There are currently five numbered sunspot regions on the Earth facing disc. The largest group is located towards the northeast limb, with two other modestly large regions in the southeast quadrant. The remaining regions in the western hemisphere are largely benign and showing decay.

Previously analysed CMEs from 21st and 22nd may give some glancing influence at Earth during the 26th, however confidence is low, and an arrival early on 27th is also possible. No other Earth directed CMEs have been observed in recent imagery.

Solar Wind / Geomagnetic Activity: The solar wind, as measured by DSCOVR and ACE at L1, showed a gradual reduction from slightly elevated levels to background levels. The magnetic field associated with the wind was at Weak levels, with the important north/south component often in the south pointing orientation. Corresponding geomagnetic activity was Quiet to Unsettled (Kp 1 to 3).

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to be generally Low, with a daily Chance of isolated Moderate-class flares.

Solar Wind / Geomagnetic Activity: This forecast period comprises two low confidence CMEs potentially arriving on day 1 (26th), and perhaps some limited coronal hole influence from a southern coronal hole later in the period.

Solar winds have gently decreased and are now settled at background levels, following the recent coronal hole influence. A potential enhancement may occur during day 1 (26th) from possible glancing CME influences, with a 30% chance of G1/minor storm intervals. Any potential influence from a southern coronal hole later in the period is most likely to be limited in impacts, with G1 currently assessed as being unlikely. In summary, geomagnetic activity is likely to remain mostly below G1 level through the period.

Energetic Particles / Solar Radiation: No solar radiation storms are expected, although there

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is a very slightly increasing risk due to the usual westward advance of the more active sunspot groups across the facing side of the Sun.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	30	10	10	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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